

**SECTION C Descriptions and Specifications****SECTION C - DESCRIPTION/SPECIFICATION****STATEMENT OF WORK****1.0 INTRODUCTION**

The Naval Surface Warfare Center Carderock Division Detachment Norfolk (NSWCCDDN) is a full spectrum research, development, test and evaluation, engineering, logistics, and technical support center for all types of combatant craft, boats and watercraft for the Department of Defense and maritime community. NSWCCDDN is chartered to support component organizations and outside agencies in these areas. NSWCCDDN clients include the U.S. Navy, U.S. Special Operations Command, U.S. Army, U.S. Marine Corps, other DoD elements, U.S. Coast Guard and other non-DoD U.S. Government agencies, and the commercial maritime community.

**2.0 SCOPE**

This contract is for the acquisition of engineering services in support of the NSWCCDDN mission covering the functional areas of program management and planning, research and development, acquisition engineering, in-service engineering, logistics engineering, and test and evaluation. This is a multi-disciplinary engineering contract including managerial, structural, mechanical, electrical, naval architectural, computer, testing, and logistician services.

Work conducted in support of the NSWCCDDN mission can be generally categorized as Systems Engineering. Systems Engineering is defined as a comprehensive, iterative technical and management process that includes translating operational requirements into configured systems, integrating the technical inputs of the entire design team, managing interfaces, characterizing and managing technical risk, transitioning technology from the technology base into program specific efforts, and verifying that designs meet operational needs. It is a life cycle activity that demands a concurrent approach to both product and process development.

**3.0 REQUIREMENTS****3.1 General**

The contractor, under the direction of NSWCCDDN and as specified in each task order, shall furnish the material, services, and facilities (except those furnished by the government under the expressed provisions of the contract) necessary for the accomplishment of this work. Inherent in providing these goods and services, the contractor shall provide the supervision and management necessary for the efficient and effective administration and control of work performed under the contract. The contractor shall ensure adequate resources are dedicated to satisfy the requirements of work assignments as tasked by individual task orders issued under the contract. Work as defined herein is applicable to boats, craft, service craft, PC Class ships, high-speed vessels, and their associated systems, hereinafter referred to collectively as watercraft, or other items as defined.

It is intended that the contract provide the flexibility for standard, urgent, complex or other support situations in fulfillment of the customer's needs. Material is defined as, but is not limited to, design, installation and logistical support documentation, prototype installation items, and production kits that may be required to modernize, alter, or support watercraft. Service is defined as, but is not limited to, providing manpower and equipment to accomplish research, development, design, logistics support, alteration development, modernization, kitting, inspections, testing, storage, and maintenance of watercraft. The performance of these services may be required at contractor facilities, government facilities, fleet operational sites, forward-deployed sites, or repair/construction industrial facilities. The Contractor may be required to work on various projects at several sites simultaneously. Each work site location may require personnel from the various labor categories. The Contractor shall be capable of supporting efforts

nationwide and worldwide. This may include travel for extended periods of time away from the home activity. Conduct of work might be accomplished on watercraft in an operational readiness status. Therefore, scheduling and completion of work are critical. Similarly there could be an inactive period when watercraft material and services or other defined efforts are not required. The contractor shall provide a quick response capability (QRC) meeting unplanned/unscheduled needs in the support of urgent or emergent requirements. Inherent in this responsiveness is the responsibility in providing the required personnel skills necessary to effect satisfactory completion of ordered work.

The Contractor shall provide the necessary materials, services and facilities (except those furnished by the government under the expressed provisions of the contract) when ordered by written work assignments, hereinafter called "task orders" which will be issued under resultant contract by the Contracting Officer, hereinafter called the Ordering Officer, or her/his Designated Representative, hereinafter called the Contracting Officer's Representative (COR). Work performed under this contract will be under the cognizance of the NSWCCDDN. The contractor is responsible for meeting all of the customer's needs as defined in the task order. Work performed under this contract will include:

- ? Program management and planning
- ? Research and development
- ? Acquisition engineering
- ? In-Service engineering
- ? Logistics engineering
- ? Test and Evaluation

### **3.2 Task A—Program Management and Planning**

Program Management for NSWCCDDN is applicable to all phases of program development, from pre-concept exploration to product phase-out of associated watercraft. Planning support is applicable to the strategic execution of the mission of NSWCCDDN.

#### **3.2.1 Program Management**

**3.2.1.1 Acquisition System.** In support of Program Management, the contractor shall evaluate planned or potential watercraft system/equipment/software acquisitions and provide recommendations for the most effective approach. The contractor shall analyze and develop program and acquisition planning documentation and information technology systems tailored to meet the needs of the watercraft system/equipment/software and phase of development. The contractor shall analyze cost, schedule, technological factors, program phase, and directives, specifications, and instructions applicable to the acquisition. The contractor shall provide innovative methods for streamlining the acquisition. The contractor shall develop program and acquisition planning documentation in accordance with directives, specifications, and instructions appropriate to the specific task (i.e. DoD 5000 Series or its replacement). Program and acquisition planning documentation and information technology systems may include:

- ? Mission Needs Statements
- ? Operational Requirements Documents
- ? System Threat Assessments
- ? Intelligence Reports
- ? Integrated Program Summaries
- ? Program Structure Charts
- ? Life-Cycle Cost Estimates
- ? Acquisition Strategy Reports
- ? Competitive Alternatives Sources Analyses
- ? Risk Assessments
- ? Environment Analyses
- ? Affordability Assessments
- ? Cooperative Opportunities Documents

- ? Decision Coordinating Papers
- ? Systems Engineering Management Plans
- ? Development Option Papers
- ? System Requirements Documents
- ? Life Cycle Management Plans
- ? Performance and Functional Specifications
- ? Statements of Work
- ? Sole Source Justifications
- ? Acquisition Streamlining Plans, Presentations and Reports
- ? Program Master Plans
- ? Production Readiness Reviews
- ? Configuration Management Plans
- ? Integrated Logistic Support Plans
- ? Test and Evaluation Master Plans
- ? Monthly Reports
- ? Production and/or Construction Plans
- ? Program and Acquisition Plans
- ? Craft and Boat Support System
- ? Service Craft and Boats Accounting Reports

**3.2.1.2 Program and Technical Financial Management.** The contractor shall develop program and technical financial management systems and models designed to facilitate the efficient and effective management of resources. The systems shall be designed to use Government Furnished Information (GFI) and to support the analyses specified by the Government. Developed systems shall interface with existing formats and computer resources. The contractor shall design, code and test the product utilizing its own resources prior to installation on the Government systems. Program and technical financial management systems may include:

- ? Cost, Schedule and Technical Performance Management
- ? Financial Systems Planning and Budgeting
- ? Systems and Database Development and implementation, including all aspects of Standards, Protocols and Interface Support
- ? Economic and Life Cycle Cost Analysis
- ? Cost Estimating and Completion Analysis
- ? Price/Technical Trade-off Analysis and Source Selections

In addition, the contractor shall develop technical performance measurement tools, in accordance with the Defense Systems Management College Systems Engineering Management Guide, for automated tools. The contractor shall install them on the Government's computer system(s). The tools shall provide the Project Office with the capability to evaluate the values achieved through the planned technical program effort; to measure the difference between the achieved and the allocated values to the program element; and to determine the impact of these variances.

**3.2.1.3 Cost Analysis and Modeling.** The contractor shall provide cost effectiveness assessments and cost benefits analyses to determine the value of technical efforts and projects. These assessments and analyses shall include life cycle and trade-off costs. For use in the development of cost analysis the contractor shall utilize design-to-cost models, life cycle cost models, and sensitivity-analysis cost models.

## **3.2.2 Planning**

**3.2.2.1 Strategic Planning.** In support of Strategic Planning, the contractor shall consider the short and long-range goals of NSWCDDN and review trends and technological opportunities directly and indirectly applicable to current and strategic NSWCDDN issues. The contractor shall analyze these trends and opportunities, and provide

recommendations regarding their potential for implementation within the private sector or within Government Agencies. The contractor shall identify threats, needs, risks, advantages, and disadvantages of potential areas of opportunity. The contractor shall support the promotion of potential market areas by developing presentation, materials, attending meetings, conferring with appropriate personnel and organizations, preparing briefs as required, and developing agendas, meeting minutes, and action item lists.

The contractor shall facilitate and support the strategic management process in order to meet the business requirements of the twenty-first century. The contractor shall perform the following functions:

- ? Preliminary planning and groundwork, such as definition of objectives, identification and evaluation of mandates, and identification of stakeholders.
- ? External environment studies to analyze market forces/trends, customers and competitors.
- ? Internal environment studies to identify resources, determine relevance of present strategy, and to assess current performance.
- ? Development of strategy, to include consideration and prioritization of issues, development of organizational vision and mission, and identification of viable alternatives.
- ? Planning implementation, to include ongoing assessment and feedback of progress.

**3.2.2.2 Business Process Improvement.** To keep pace with the rapidly developing global market, the contractor shall provide the guidelines, approaches, tools and techniques to plan and conduct Business Process Improvement (BPI) projects in a broad range of business situations. This continuous improvement process shall focus on the customer base of NSWCDDN and include more efficient and effective policies, processes, organizations, information technologies and physical infrastructures.

The contractor shall focus on the redesign of existing business to achieve dramatic improvements in critical, contemporary measures of performance, to include cost, quality, service and speed. Initial targets of improvement shall be the business objectives, including customer service fulfillment, finance and reporting, operations, information, technology management, and new product and system development. BPI approaches may include:

- ? Operation Reviews
- ? Performance Assessment and Measurement
- ? Organizational Change Management
- ? Facilities Sizing
- ? Optimization
- ? Simulation
- ? Automation Hardware/Software Assessment
- ? Quality Programs/TQM/ISO9000 series

### **3.3 Task B—Research and Development**

Conventional and unconventional watercraft of various sizes are expected to play a critical role in “Sea Power 21,” the Chief of Naval Operations vision for naval transformation in the 21<sup>st</sup> century. Three overarching operational concepts embody this vision: “Sea Strike,” “Sea Shield,” and “Sea Basing.”

Within “Sea Strike” small watercraft will offer highly maneuverable, stealthy platforms capable of persistent intelligence, surveillance, and reconnaissance (ISR) operations in both manned and unmanned scenarios including autonomous operations. With the cascaded deployment of unmanned vehicles and ISR sensors small watercraft will evolve into a vital naval asset connecting command and control elements with timely intelligence from the forward battlespace across the joint and national command and control network providing prompt and precise battlespace awareness at any time and in any weather.

Small watercraft will also play a vital role in the successful implementation of the “Sea Shield” transformational capability of littoral sea control. Deployment of a small watercraft engineered with modularity for multi missions

such as mine countermeasure, anti-submarine warfare, or defeating fast enemy surface combatants (SWARM), will help to achieve the objective of joint force access and freedom of maneuver from the sea base.

New-generation high-speed cargo transport vessels continue to emerge on the international maritime scene. These vessels offer opportunities within the “Sea Basing” transformational concept to effect rapid projection of combat logistic materiel from the sea. Development of higher cargo carrying capacity high-speed vessels will be essential. Development of innovative lighterage and landing craft technologies will result in accelerated deployment and employment times during logistic supply operations.

### **3.3.1 Transformational Technology**

In support of the “Sea Power 21” vision for naval transformation, the Contractor shall perform basic and applied research and development dedicated to the advancement of watercraft capabilities and their ability to support the “Sea Strike,” Sea Shield,” and Sea Basing” operational concepts. This may include operational needs in the areas of Homeland Defense, Force Protection, Naval Special Warfare, Naval Coastal Warfare, Marine Expeditionary Forces, Army Rapid Deployment Forces, and Army Force Projection, including military operations in high threat environments throughout the world. Focus areas will include advancing the state of the art in areas such as:

- ? Advanced materials and methods of construction to include composites, metals, and alternative construction techniques in the areas of welding, gluing and riveting.
- ? New hull forms for the purpose of shock mitigation, more stable platforms for weapons, higher speeds, and multi-mode unmanned vehicles (above the surface, on the surface, and below surface).
- ? Modular design concepts for multi-missions.
- ? New propulsion systems that would be more energy efficient, reduce wakes, incorporate alternative fuels, achieve higher speeds, be more maneuverable in close quarters environment, be more reliable for unmanned vehicles, and incorporate multi modes to include above, on, and below the surface, operating from the water, through the surface, and over the beach.
- ? Reducing craft signatures in the areas of radar cross section, electro-optical, visual and infra-red, and acoustic through means of shaping, integration of retractable components, conformal antennas incorporation of light filtering, and camouflaging through covers and paint systems.
- ? Improved integration of command, control, communications, computers, intelligence, surveillance, and reconnaissance systems into watercraft for manned and unmanned and autonomous operations.
- ? Craft Improvement Program (CIP): Topic areas either requested from the fleet or offered from within the government.

### **3.3.2 Operations Research**

The contractor shall provide technical and operations research for projects that vary widely in nature and complexity. A clear understanding of all tactical and technical implications of the project, human and equipment capabilities and limitations, target defenses and vulnerabilities, available support assets, tactical mobility requirements, command and control, and mission planning, preparation and training is necessary. This research may include:

- ? Existing Tactics
- ? Tactical Development and Evaluation
- ? Plans and Policy Review
- ? Operations Research and Analysis
- ? Warfare Systems Analysis
- ? Historical Archives Research
- ? Field Tests of Tactics and Procedures

The contractor shall organize the data gathered during research into working papers, issue papers, point papers, and/or formal reports. End product may include formulation of policy, doctrine, tactics and procedures, as well as articles suitable for publishing for tactical publications (TACMEMOS; TACNOTES; Tactical Bulletins), Naval Warfare Publications, and Joint Warfare Publications.

### **3.4 Task C—Acquisition Engineering**

The contractor shall provide systems and design engineering support to assist in the effective application of scientific and engineering efforts to transform validated operational needs into thoroughly defined system configurations through a documented process of requirements definition, functional analysis, synthesis, optimization, design, and evaluation in support of watercraft acquisition under the Defense Acquisition System DoD 5000 Model.

#### **3.4.1 Systems Engineering**

The contractor shall provide support within any element of the systems engineering discipline. This includes specialty-engineering expertise as required. Specialty engineering may include:

- ? Quality
- ? Logistics
- ? Testability
- ? Producibility
- ? System Safety
- ? Transportability
- ? Standardization
- ? Human Factors
- ? Manning Analysis
- ? Value Engineering
- ? Computer Modeling
- ? System Certification
- ? Environmental Effects
- ? Survivability/Hardness
- ? Computer Software/Systems
- ? Systems Requirements Analysis
- ? Operational Performance Analyses
- ? Reliability, Maintainability, Availability
- ? Electromagnetic Compatibility/Interference

**3.4.1.1 Feasibility Studies.** The contractor shall perform feasibility studies for current or new technologies applicable to watercraft and maritime technologies. This may include the identification of possible solutions to meet a need, the screening of alternatives, the selection of a preferred approach, assessing system performance characteristics (modeling and physical test and evaluation), and designing possible alternatives (modeling, breadboards, prototypes, engineering development models, etc.). The contractor shall evaluate alternatives using factors such as technical performance, reliability and maintainability, cost, schedule, and supportability.

**3.4.1.2 Market Research.** The Contractor shall conduct market research in support of the acquisition engineering process. Market research is a process for gathering data on watercraft and their equipment/systems characteristics, suppliers' capabilities and the business practices that surround them. It includes the analysis of that data to make acquisition decisions. The Contractor shall report the results of market research such that the information can be used to help shape the acquisition strategy, to determine the type and content of the watercraft description or statement of work, to develop the support strategy, the terms and conditions included in the acquisition contract, and the evaluation factors used for source selection.

#### **3.4.2 Design**

The contractor shall perform a variety of maritime technology functions that are dependent on the type of system and the extent of new development necessary. The contractor shall be expected to perform design functions as well as performing independent verification and validation of products developed by other activities. The contractor

shall provide technical support that includes a mix of marine engineering disciplines including naval architecture, mechanical engineering, electrical/electronic engineering, software engineering, and related engineering. The Contractor shall perform design efforts normally associated with marine engineering tasks needed to effect watercraft design, developmental test, and evaluation. These efforts may include engineering calculations and analyses, computer modeling, theoretical design, operational requirements documentation, drawing development (concept, contract, and construction), specification development (performance and detailed), test and evaluation plans, developmental test plans, technical information/data packages, etc. Information systems support and experimental equipment support services may also be required. The contractor shall provide technical and operational support from a total systems approach. Systems support shall be organized in depth, contain mutually supporting elements, and be coordinated to prevent gap or overlap in responsibilities and performance.

**3.4.2.1 Naval Architect Design.** Inherent is knowledge and ability in hull design, hydrodynamics, stability, mass properties, arrangements, and structures for watercraft. An expertise in materials (i.e. steel, aluminum, fiber-reinforced plastic (FRP), and wood) is necessary.

**3.4.2.2 Mechanical Design.** Inherent is knowledge and ability in marine propulsion and auxiliary equipment and systems integration design, thermodynamics, fluidics, mechanics of mechanisms and structures, failure analysis, systems dynamics, and properties of materials.

**3.4.2.3 Electrical/Electronic Design.** Inherent is knowledge and ability in marine electrical and electronic equipment and systems integration design; power generation, conversion, and distribution; illumination; interior/exterior communications; navigation; control systems; networks; and other electronics.

**3.4.2.4 Software Design.** Inherent is knowledge and ability with systems analysis techniques for local and wide area networks, stand-alone computer systems, and related peripheral equipment. The contractor shall be capable of designing and reviewing software developed in any of the languages currently used.

**3.4.2.5 Related Engineering Design.** The contractor shall perform functions related to marine engineering including development of functional and reliability block diagrams, reliability, availability, and maintainability allocations and predictions, human factors engineering, safety engineering, environmental analysis, engineering economics, etc. The contractor shall analyze overall systems design and prepare system and component specifications, and define quantitatively and qualitative parameters.

### **3.4.3 Model / Prototype Design and Fabrication**

The contractor shall provide the materials, equipment and services necessary to fabricate, and assemble breadboards, prototypes, engineering-development models, and advanced development models as required supporting NSWCCDDN tasks. These prototype models will be used to determine feasibility or provide proof of concept, validate watercraft design efforts and assess producibility. These systems will be evaluated to form the basis for production design decisions.

### **3.4.4 Surveys and Assessments**

The acquisition of equipment and watercraft require necessary and careful monitoring of the vendor or production yard performing the construction or testing to ensure that contract specifications are adhered to, that cost is carefully controlled, and that schedule is maintained. The contractor shall provide independent surveys, assessments, and analyses that include verification of acquisition process, assistance in specification and change development, and final testing of equipment or watercraft.

The contractor shall support production and/or construction efforts contracted by NSWCCDDN or other activities associated with NSWCCDDN. This support may include assisting the Government with hardware/software contractor site surveys, reviewing hardware/software contractor quality assurance and production capabilities, identifying potential vendor/contractor sources, source selection, and reviewing/observing acceptance and qualification of final products.

### **3.5 Task D—In-Service Engineering**

The contractor shall provide systems and design engineering support to assist in the effective application of scientific and engineering efforts to transform validated performance improvement and ownership cost reduction efforts into thoroughly defined system modifications/alterations through a documented process of requirements definition, functional analysis, synthesis, optimization, design, and evaluation in support of watercraft In-Service Engineering under the U.S. Navy Fleet Modernization Program (FMP) (ref: NAVSEA SL720-AA-MAN-010) as tailored for watercraft by NSWCCDDN (or other military/government agency equivalent watercraft sustainment program).

#### **3.5.1 General**

An alteration is any change in the configuration of a system, equipment, machinery, hull or fitting of a watercraft. This includes any change in design, type of material, quantity, location, or the relationship of component parts of an assembly regardless of whether it is undertaken separately from, incidental to, or in conjunction with repairs. The term "alteration" is in general accordance with the requirements of NAVSEA Tech Spec 9090-310 as addressed herein and in individual task orders.

An Alteration Installation Team (AIT), as defined herein, is a group of personnel under the cognizance of NSWCCDDN that is trained, equipped, tasked and funded to accomplish specific alterations on specific watercraft. The team may consist of any combination of military, civilian, or contractor personnel. The AIT is responsible in general accordance with the requirements of NAVSEA Tech Spec 9090-310 as addressed herein and in the task order for its application to watercraft.

#### **3.5.2 Alteration Development**

The Contractor shall perform design and management efforts normally associated with marine engineering tasks (previously defined under "Acquisition Engineering") needed to effect change in watercraft performance (improved or new/different capability) and-or reduction in ownership cost through thoroughly defined system modifications/alteration packages. Alteration packages may consist of Liaison Action Records (LAR), Justification/Cost Forms, Boat/Craft/Ship Alteration Records (BOATALT, CRAFTALT, SHIPALT), and installation drawings. The content of alteration package elements shall meet the requirements of NAVSEA SL720-AA-MAN-010, or as otherwise specified in the specific task order. The Contractor shall provide marine engineering design capabilities in support of alteration development similar to the design services listed under "Acquisition Engineering" above.

The Contractor shall include testing and evaluation requirements in all alteration documentation for the modified systems/components. This may include the following items:

- ? Electrical
  - ? Proper continuity in cables and correctness of electrical hookup;
  - ? Proper bonding, grounding, and shielding of cables and equipment;
  - ? Proper input and output voltage levels;
  - ? Proper insulation resistance of each cable;
  - ? Proper polarity/rotation of motors;
  - ? Proper use of cable/wiring installation methods;
  - ? Ensuring kick pipes and stuffing tubes used for all penetrations of decks and watertight bulkheads maintain appropriate integrity of damage control boundary
  - ? Inspection for chafing at penetrations of non-watertight bulkheads
- ? Hull
  - ? Air test, water test and chalk testing of water tight accesses or compartment closures
  - ? Non-destructive testing of weld joints
  - ? Validity of gas free certificate prior to welding

- ? Proper isolation of dissimilar metals
- ? Mechanical
  - ? Hydrostatic pressure test of piping and pressure vessels
  - ? Alignment of rotational components (e.g., shaft alignment)
  - ? Unobstructed flow verification of piping systems
  - ? Static and dynamic testing of deck machinery and weight handling equipment
  - ? Flow rate of air and ventilation systems
  - ? System operational tests (e.g., cooling and heating systems, propulsion trials, etc.)

### **3.5.3 Alteration Installation**

The contractor shall provide the necessary facilities, equipment, tools and personnel skills to accomplish hull, mechanical, and electrical alteration installations. These installations shall include, but are not limited to, all systems, equipment, and components of watercraft or other items as identified.

**3.5.3.1** The contractor shall conduct pre-alteration site surveys, as tasked in the task order, identifying situational impediments between the general technical documentation and the specific physical and environmental conditions prior to alteration commencement. (Note: NSWCCDDN will arrange and coordinate all such visits.) Necessary information obtained during the site survey shall be provided in adapting the technical documentation to the specific work. The contractor shall provide an engineering-led expertise in support of pre-alteration site surveys.

**3.5.3.2** The Contractor shall provide engineering-based AIT leadership. Conduct team leader meeting with NSWCCDDN installation manager in accordance with the task order schedule prior to an installation. The team leader shall prepare a draft schedule depicting progress of daily installation and cost expenditures prior to team leader meeting. Team leader shall be prepared to discuss all aspects of installation including material status, shipping schedule, funding status, installation requirements, and safety concerns.

**3.5.3.3** The contractor shall provide the necessary facilities to pre-fabricate parts and components, assemble, stage, and distribute material to the job site. All tooling required for pre-fabrication or installation shall be provided.

**3.5.3.4** The Contractor shall provide necessary administrative and logistics support at installation site for team and Government personnel which may include standard office setup with telephones, fax machine, copy machine and computers, local material purchasing capabilities, and special installation requirement coordination when required by a specific task order.

**3.5.3.5** The Contractor shall provide portable workshops as required to support the team. A portable workshop is considered to be any temporary structure that can be placed near the place of work performance, which provides space, storage and equipment necessary to accomplish the task. The Contractor shall provide the necessary tools, equipment and maintenance for the portable workshops required in accomplishing the task.

**3.5.3.6** The Contractor shall rehabilitate spaces disturbed by the installation to original or equivalent condition, which includes, but is not limited to cleaning, preparing, priming and painting new and/or disturbed surfaces to match surrounding areas; and replacing all deck coverings, insulation or lagging damage incidental to installation. Replacement material shall match existing styles, colors and grades unless otherwise specified on the task order.

**3.5.3.7** The Contractor shall prepare and install applicable labels/tags for all HM&E systems installed. Identification marking of individual parts within the systems, equipment, assemblies, subassemblies, components, groups, sets, or kits, and of spare and repair parts shall be done in accordance with applicable specifications and drawings as identified under individual task orders. To the extent identification marking of such parts is not specified, markings shall be in accordance with generally accepted Government or commercial practice.

### **3.5.4 Watercraft Rehabilitation Engineering Support**

The rehabilitation/overhaul of equipment and watercraft require necessary and careful monitoring of the vendor or production yard performing the overhaul, repair, or testing to ensure that contract specifications are adhered to, that cost is carefully controlled, and that schedule is maintained. The contractor shall provide on-site support to oversee watercraft rehabilitation/overhaul performance. The contractor shall provide the necessary personnel skills to accomplish hull, mechanical, and electrical system rehabilitation inspections and surveys including: pre-overhaul, in-process, and testing/trials. The contractor shall develop inspection reports, work specifications, test procedures, test reports, and progress reports.

### **3.5.5 Prototype Installation**

The contractor shall provide for all aspects of prototype installations. A prototype installation, as defined herein, is an alteration providing a capability on a temporary basis during evaluation in support of research, development, test and evaluation, or other requirements. Prototype models will be used to determine feasibility or provide proof of concept, validate combatant craft design efforts, and access its producibility. The purpose of this effort is for the contractor to partner and/or team with the Government to correct, improve or otherwise validate the installation safety and technical adequacy. The contractor is to perform the installation per the task order and provide feedback comments, input, marked-up technical information, marked-up drawings such that future installations will result in best value to the Government. The team shall notify the Government should problems exist prior to performing the installation where the direction will result in costly mistakes.

## **3.6 Task E—Logistics Engineering**

### **3.6.1 General**

The contractor shall provide Integrated Logistics Support (ILS) for a variety of watercraft programs and technology insertion projects. This support shall include the analysis, development, review, maintenance, and tracking of system and equipment logistics support planning, maintenance, training and documentation. The contractor shall participate in logistics associated conferences and meetings to present concerns, making recommendations and gathering additional data as required. Examples of meetings include:

- a. Program Reviews
- b. Integrated Logistics Management Team (ILSMT) Meetings
- c. In-process Reviews (IPRs)
- d. Quarterly Program Reviews (QPRs)
- e. Technical Interface Meetings (TIMS)

The contractor shall perform research, maintenance and update of the various watercraft system Program Support Data (PSD) in the PSD Automated Reporting and Tracking System (PARTS) for the assigned hardware.

The contractor shall provide engineering, technical and analytical support for all ILS disciplines and elements. Specific examples are listed below.

### **3.6.2 Technical Data**

The contractor shall support the development, update, conversion, and/or review of Technical Manuals (TMs). The objective of this sub-task is to provide a more effective way of supporting the end user in the operation and maintenance of installed watercraft equipment. To this end, the contractor shall suggest innovative ways to improve the development, delivery, and maintenance of such technical data products.

**3.6.2.1** The contractor shall support development of conventional hardcopy technical manuals, and development of Interactive Electronic Technical Manuals (IETMs) up to and including Level 4 in accordance with applicable Technical Manual Contract Requirements (TMCR) and the Statement of Work (SOW) for the specific Task Order. Developed technical manuals shall be in accordance with the output format specified in the individual Task Order.

**3.6.2.2** The contractor shall support conversion of existing manuals or Commercial-Off-The-Shelf (COTS) manuals to electronic format and shall support the IETM Level and output format specified in the individual Task Order.

**3.6.2.3** The contractor shall support update of technical manuals as identified in Technical Manual Deficiency Reports (TMDRs), engineering changes, or other requirements as specified in the individual Task Order.

**3.6.2.4** The contractor shall support review of COTS technical manuals for accuracy and completeness to standards specified in the individual Task Order.

**3.6.2.5** The contractor shall support development and production of electronic or non-electronic media as specified in the SOW; media types include hardcopy, CD-ROM, DVD-ROM, and ATIS compatible. All media delivered shall be compatible with and executable by system hardware and operating systems as specified in the individual Task Order.

### **3.6.3 Supply Support**

The contractor shall develop, review, update, and maintain complete supply support documentation. The contractor shall be responsible for analyzing maintenance plans, engineering drawings, reliability data, level of repair, and scheduled maintenance data in support of the provisioning process. The contractor shall identify spare parts requirements, perform inventory management, and determine lead times.

**3.6.3.1** The contractor shall perform physical validation of watercraft and/or equipment to determine actual equipment configuration. Validation results shall conform to requirements as specified in the individual Task Order. Validation results will typically be in a format and data content sufficient to update the Ship's Configuration and Logistics Support Information System (SCLSIS) database via the Configuration Data Manager's Database – Open Architecture (CDMD-OA) interface, or as otherwise directed.

**3.6.3.2** The contractor shall develop, update, and maintain complete supply support documentation in the form of Provisioning Technical Documentation (PTD) and supporting Data For Provisioning (DFP) packages. The Contractor shall maintain the resulting Allowance Parts Lists (APLs) or Allowance Equipage Lists (AELs) required due to hardware procurement, Design Change Notices (DCN), field change bulletins (FCB) or from other engineering or configuration changes. PTD packages shall be developed in accordance with applicable standards and/or instructions as identified in the individual Task Order.

**3.6.3.3** The contractor shall provide PTD in formats and media specified in the individual Task Order. ICAPS-CS is the required software format for navy applications, and Power Log is the required software format for Army applications.

**3.6.3.4** The contractor shall procure miscellaneous parts and equipment to support watercraft equipment and installations.

### **3.6.4 Maintenance Development and Support**

The contractor shall perform independent analysis and technical studies and provide engineering and technical services in the area of mission related maintenance engineering.

**3.6.4.1** The contractor shall perform maintenance planning tasks such as maintenance and material management (3M); planned maintenance system (PMS) development; level of repair analysis (LORA), maintenance concept formulation, and identification of corrective and preventive (scheduled) maintenance procedures. The contractor shall develop, review and / or update maintenance procedures in formats and to specifications described in the individual Task Order. The contractor shall review and update current analysis guides and maintenance assessment procedures and prepare new documents for in-service updates and new equipment. The contractor shall review and update existing maintenance management and planning documents.

**3.6.4.2** The contractor shall be capable of perform, review, and-or analyze the reliability and maintainability predictions and allocations; reliability program plans; reliability improvement/growth programs; failure reporting, analysis, and corrective action system; failure modes, effects, and criticality analysis (FEMCA); use/develop analytical models as necessary to perform these tasks. The contractor shall perform Reliability, Maintainability and Availability (RMA) analysis and / or trend analysis for watercraft systems or equipment. The contractor shall research commercially available predictive/condition based diagnostics and applications that can be integrated with existing systems that will achieve new efficiencies in preventive and / or corrective maintenance and produce a positive return on investment on lifecycle resource investment.

### **3.6.5 Design Interface**

The contractor shall provide design interface and analysis in order to relate all design characteristics to system support characteristics. The interface includes the development of technical planning data, life cycle cost analysis and return on investment studies.

### **3.6.6 Training and Training Support**

The contractor shall develop processes, techniques and equipment as necessary to support training or training development for watercraft and watercraft systems/equipment. The contractor shall provide operator and maintenance training support for installed watercraft systems and technology upgrades. This task encompasses planning, analysis, coordination, development, review and maintenance of various watercraft systems and associated interface systems. Specific support may include the development of training program plans, requirements and documentation via software (HTML, SGML, or XML as specified in the task order) and hard copy, and development and maintenance of Interactive Multi-media Instructional (IMI) materials as specified by the task order, this SOW and applicable CDRLs. IMI products delivered under this sub-task must be compliant with latest Navy standards and be fully compatible with web-based delivery. Training support shall include potential application of distributed modeling and simulation for training utilizing Distributed Interactive Simulation and-or DoD High Level Architecture (HLA) capable of modeling deployment activities for various platforms. This may include:

- Development/update of Navy Training Support Plans (NTSPs).
- Analysis of equipment for scope of training requirements.
- Vendor interface for identification or procurement of training aids or assets.
- Interface with commercial entities for evaluation and /or implementation of training courses.

### **3.6.7 Manpower and Personnel**

The contractor shall evaluate systems or equipment in order to identify military or civilian personnel requirements with the skill levels and grades required to operate and support said system or equipment throughout its service life in peacetime and wartime environments.

### **3.6.8 Packaging, Handling, Storage and Transportation**

The contractor shall provide support to define and document the requirements, resources, processes, procedures, design considerations, environmental considerations, and methods necessary to ensure that all watercraft, systems, equipment, and support items are preserved, packaged, handled, and transported properly.

### **3.6.9 Support Equipment**

The contractor shall provide support for the equipment (mobile or fixed) required to support the operation and maintenance of watercraft systems and equipment. This includes associated multi-use end items, ground handling and maintenance equipment, tools, metrology and calibration equipment, and test equipment.

The contractor shall identify and/or analyze the requirements for general-purpose support equipment (GPSE) and special-purpose support equipment (SPSE) in support of NSWCCDDN operation and maintenance functions. The contractor shall include common support equipment, and special support equipment for both mechanical and

electrical/electronic systems. This includes the analysis of handling and maintenance, repair, and built-in-test and diagnostics for hardware and software.

### **3.6.10 Facilities**

The contractor shall provide support for any real property (structure, building, utility system, etc.) necessary to support a watercraft and watercraft systems. This includes permanent, semi-permanent, or temporary real property assets required to support the system, including conducting studies to define facilities or facility improvements, locations, space needs, utilities, environmental requirements, and real estate requirements.

### **3.6.11 Configuration Management**

The contractor shall provide full spectrum configuration management (CM) support for watercraft total lifecycle. This includes development of CM Plans, configuration item identification, physical and functional audits, configuration status accounting, and engineering change proposal development, evaluation and processing.

### **3.6.12 Management Information System Support**

The contractor shall install, maintain and manage Government-owned Management Information System (MIS) resources. Spare parts evaluation and procurement, associated with upgrades, augmentations and new initiatives shall also come under the purview of the contractor. The contractor shall ensure that the equipment is installed and maintained in a manner that is consistent with local and national codes and manufacturer's recommendations. The contractor shall provide on-site database support to Government/private sector personnel that are performing database selection, writing, input, maintenance, retrieval and training. The contractor shall also perform these functions (selection, writing, input, maintenance, etc.) as required.

### **3.6.13 Boat Inventory Management Support**

The contractor shall provide services for overall boat inventory management including stock boat management, boat acceptance testing and inspection, boat fleet introduction, and technical support for inventory management. The Contractor shall provide inventory management of boats from pre-delivery through post-disposal management services, including Quasi-Title and Certificate of Build documentation. The Contractor shall manage overall boat location and shall validate boats in-service throughout the world, afloat and ashore, including discrepancy reporting and Service Craft And Boat Accounting Report (SABAR) updates utilizing the Craft and Boat Support System (CBSS). The Contractor shall provide support services to boat warehouse activities (e.g., damage reports, boat asset monitoring and reporting, evaluating systems condition of boats in storage, stock (storage) facility boat asset management at stock points including boat inspections, boat condition evaluation and reporting, destination and required delivery date management, shortage reporting, etc.).

## **3.7 Task F—Test and Evaluation**

### **3.7.1 General**

The contractor shall support designated tests, trials, and evaluation as tasked in the task order. Test and evaluation support may be required during research and prototype development, low rate initial production, full rate production, and in-service / sustainment periods of watercraft and watercraft systems lifecycle. Testing and evaluation may include performance demonstrations, operational demonstrations, maintenance demonstrations, reliability testing, software Beta testing, supportability testing, and independent verification and validation. The support for testing may consist of:

- ? Test procedure development
- ? Test preparation
- ? Test performance
- ? Test results analysis

? Test results reporting

### **3.7.2 Test Procedure Development**

The contractor shall develop procedures for conducting testing and evaluation. Types of procedures may include Test and Evaluation Master Plans, Developmental Test Plans, Operational Test Plans, Specialty Test Plans (e.g. reliability, maintenance demonstrations, technical manual validation, etc.), and proof tests. The contractor shall perform all functions necessary to successfully complete test planning documentation. This includes identification of prerequisites and safety precautions; identification of test steps, objectives and thresholds to be achieved; identification of pass-fail criteria for all applicable steps; identification of support resources required to conduct the test (e.g. instrumentation, sites, personnel, hardware/software, funding, etc.); identification of evaluation methods and data reduction techniques; identification of test reporting requirements; identification of failure feedback mechanism; and identification of test sequencing and scheduling.

### **3.7.3 Test Preparation**

The contractor shall locate appropriate test sites and acquire or assist in acquiring access to the test site(s); locate, acquire, and setup instrumentation, sensors, test ranges, etc.; and provide logistical resources. Logistical resource support may include pre-test training, calibration of test instrumentation, maintenance of instrumentation and software during data collection, test performance, location and acquisition of spare parts, and transportation/shipment of test instrumentation/software/hardware.

### **3.7.4 Test Performance**

The contractor shall perform the requirements of approved test procedures. This may include test director responsibility, data recording, reading instrumentation, inspections, evaluation of raw data, and recommendations for re-test/failure recovery. Similar efforts may be required of the contractor in a supporting role when tests are being conducted by other activities.

### **3.7.5 Test Results Analysis**

The contractor shall analyze the results of collected data including failure or other feedback reports, apply appropriate evaluation techniques, reduce data as necessary, identify trends (repeated failures, anomalies, deficiencies, etc.), and make conclusions and recommendations regarding these testing and evaluation results. Conclusions and recommendations may necessitate re-evaluation of thresholds and objective parameters established by operational requirements and test planning documentation, redesign of all or portions of the hardware/software, and recommendations for passing, failing, or conditionally passing entire object under test.

### **3.7.6 Test Results Reporting**

The contractor shall develop reports documenting the conduct of testing and evaluation and all results. These reports shall be written to a level of detail appropriate to the test at hand. Test reports shall include information relative to general test methodology employed, tests conducted, raw and/or reduced data collected, results, conclusions, recommendations, and summaries. Test reports shall follow a format as specified in the task order.

## **4.0 QUALITY CONTROL**

Quality Control (QC) Program – The contractor shall conduct all work in accordance with a formal and documented quality control program applicable to all types and phases of engineering support covered in this contract.

The quality of all services rendered in execution of this SOW shall conform to the highest standards in the relevant profession, trade, or field of endeavor. All services shall be rendered by or supervised directly by individuals fully qualified in the relevant profession, trade or field, and holding all licenses required by law.

## 5.0 STANDARDS/SPECIFICATIONS/REFERENCES

Standards and specifications controlling individual tasks will be identified in each task order and may include:

- ? DoDD 5000.1 The Defense Acquisition System
- ? DoDI 5000.2 Operation of the Defense Acquisition System
- ? American Bureau of Shipping Codes, Guides and Practices
- ? United States Code of Federal Regulations Title 46 Shipping
- ? American Boat and Yacht Council Recommended Practices and Standards
- ? Institute of Electrical and Electronic Engineers
- ? American Society of Mechanical Engineers Codes and Standards
- ? American Society of Heating, Refrigerating and Air Conditioning Engineers Handbook of Fundamentals
- ? Society of Automotive Engineers
- ? American Institute of Steel Construction
- ? American Society for Testing and Materials Specifications
- ? American Welding Society
- ? United States Coast Guard Pamphlet CG 169 Navigation Rules, International Inland 72 COLREGS
- ? NAVSEA Standard work items
- ? Standard Specifications for U.S. Navy Craft
- ? Naval Ships Technical Manual (NSTM) series
- ? NAVSEA Fleet Modernization Program Management and Operations Manual
- ? DOD-STD-2003 (NAVY) Electrical Plant Installation Standard Methods for Surface Ships and Submarines
- ? MIL-STD-461 Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment
- ? MIL-STD-1310 Shipboard Bonding, Grounding, and Other Techniques for Electromagnetic Compatibility and Safety
- ? MIL-STD-22 Welded Joint Design
- ? MIL-STD-1689, Fabrication, Welding and Inspection of Ships Structure
- ? NAVSEA T9008-B4-MAN-010 Inspection and Repair Manual for Fiber Reinforced Plastic Boats and Craft
- ? NAVSEA 0900-LP-060-4010 Fabrication, Welding and Inspection of Metal Boat and Craft Hulls
- ? NAVSEA TO300-AU-SPN-010 Fabrication, Welding and Inspection of Small Boats and Craft, Aluminum Hulls
- ? United States Army Regulation AR 70-38 Research, Development, Test and Evaluation of Material For Extreme Climatic Conditions
- ? Watercraft Construction Drawings (as-built)
- ? BOATALT, CRAFTALT or SHIPALT Record or Liaison Action Record (LAR) for Alteration Installation Teams

Other documents not listed above may also be invoked, as required, for individual task orders.

## 6.0 PERSONNEL QUALIFICATIONS

### 6.1 General

The contractor shall be responsible for employing technically qualified personnel to perform the tasks to be ordered hereunder. The contractor shall maintain the personnel, organization, and administrative control necessary to ensure that the work delivered meets the contract specification requirements. The work history of each employee must contain experience directly related to the task and functions he/she intends to perform under this contract.

The Government reserves the right, during the life of this contract, to request work histories on any contractor employee for purposes of verifying compliance with this requirement. Personnel assigned to or utilized by the contractor in the performance of this contract shall, as a minimum, meet the experience, educational, or other background requirements set forth herein, and be fully capable of performing the contemplated functions of the respective labor categories in an efficient, reliable, and professional manner.

If the contracting officer questions the qualifications or competence of any person performing under the contract, the burden of proof to sustain that the person is qualified as prescribed herein shall be upon the contractor.

## **7.0 TECHNICAL CONFERENCES/REVIEW MEETINGS**

Contractor and Government representatives shall meet monthly or as required by the government, for the duration of the contract to review the Contractor's performance in providing services under this contract. The contractor shall provide Program Progress Report as specified on the DD Form 1423, CDRL A001.

Contractor personnel shall be available for informational meetings with technical personnel at NSWCCDDN or at the Contractor's facility to discuss the direction, progress, results, and/or problems that occur during the performance of each task order placed under this contract.

## **8.0 DELIVERABLES (DATA REQUIREMENTS):**

The basic Data Requirements List (DRL) requirements are provided in Exhibit A, attached hereto. Data requirements are to be tailored for each particular task order. The deliverables and DRL requirements for each individual task order will be identified by the Government as a part of each task order and shall be a requirement of that particular task. DRLs identified below with an asterisk are required throughout the life of the contract whether or not they are uniquely identified in a specific task order. If additional CDRLs are required for a specific task, the requirement and the appropriate Data Item Description (DID) will be provided as attachments to the task order.

*A001	DI-MGMT-80555	PROGRAM PROGRESS REPORT (MONTHLY STATUS REPORT)
A002	DI-MGMT-80368	STATUS REPORT (CONTRACTOR LEADER MEETINGS AND STATUS REPORTS)
A003	DI-ILSS-80521	MATERIAL STATUS REPORT
A004	DI-MGMT-80368	STATUS REPORT (ALTERATION INSTALLATION TEAM FINAL FINANCIAL REPORT)
A005	DI-MGMT-80894A	SOURCE/VENDOR LIST (INDEX OF PURCHASE ORDERS)
A006	DI-MISC-80711	SCIENTIFIC AND TECHNICAL REPORT
A007	DI-ADMN-81373	PRESENTATION MATERIAL
A008	DI-NDTI-80603	TEST PROCEDURE
A009	DI-MISC-80678	CERTIFICATION/DATA REPORT
A010	DI-SESS-81001B	CONCEPTUAL DESIGN DRAWINGS
A011	DI-SESS-81002B	DEVELOPMENT DESIGN DRAWINGS AND ASSOCIATED LISTS
A012	DI-SSES-81000B	PRODUCT DRAWINGS AND ASSOCIATED LISTS
A013	DI-SSES-81003B	COMMERCIAL DRAWINGS
A014	DI-SDMP-81493	PROGRAM-UNIQUE SPECIFICATION DOCUMENTS

## **9.0 GOVERNMENT FURNISHED INFORMATION (GFI) AND MATERIAL (GFM)**

Any required Government Furnished Information will be provided as an attachment to the appropriate Task Order.

The Government may furnish some material under this contract. Any GFM to be furnished shall be identified in individually placed task orders.

## **10.0 SECURITY**

The Department of Defense Contract Security Classification, DD Form 254 (see attachments), itemizes the security classification requirements for this contract. The work to be performed under this contract shall involve access to, and handling of, classified material up to and including SECRET.

Accordingly, the contractor shall have or obtain a Facility Security Clearance, provide classified storage capability, and obtain security clearances on certain key personnel, and conceivable other personnel performing under the contract. An applicable DD Form 254, Contract Security Classification Specification, shall be issued with each task order under the contract whenever the basic DD 254 does not provide sufficient classification guidance.

The contractor shall provide clearance information data to NSWCCDDN prior to task order start date. Data to include list of all contractor personnel supporting the task, social security numbers, addresses, citizenship, and level of clearance.

## **11.0 CONTRACTOR FACILITIES**

The contractor shall have a functioning main office within proximity of Gate 1 of the Naval Amphibious Base Little Creek, VA that enables timely and efficient routine visits between contractor personnel and government personnel for liaison with appropriate officials and performance of work. In satisfying this requirement, the contractor may consider teaming with other contractors having different facility locations. The office facilities shall have the furnishings for a standard office space and conference room in support of expected number of personnel including:

- a. ADP equipment compatible with Microsoft (MS) Windows as the standard Network Operating System and MS Office 2000 (or later) core products (Word, Excel, Outlook, and PowerPoint) as the standard office software. The use of Open Architecture Relational Data Base Management System and Web applications is required. The use of AutoCAD, Version 14.0 is required as a minimum. The use of MS Project 2000 (or later) is required.
- b. FAX, copier, scanner, and telephone and other resources usually found in a functioning office environment.

The contractor shall have a warehouse, laboratory, and shop facilities within proximity of Gate 1 of the Naval Amphibious Base Little Creek, VA that enables timely and efficient routine visits between contractor personnel and government personnel for access and use of these facilities. In satisfying this requirement, the contractor may consider teaming with other contractors having different facility locations. The facilities shall include as a minimum:

- a. Warehouse space shall be secure, lockable, segregated, and clean with storage area for small and large items, and with entryway sized to accommodate shipping and receiving of these items with mechanically-powered rolling transporters.
- b. Laboratory space with environmentally controlled (HVAC) climate and nominal Electrical Power requirement of 240-Vac, 60-Hz, 100-amperes service with distribution for 240-Vac and 120Vac loads.
- c. Indoor shop facility with typical lighting and electrical service, and capable of accepting a trailered watercraft of up to 45 feet in length.

Time duration of up to one hour to commute by automobile between the contractor's facilities and Gate 1 of the Naval Amphibious Base Little Creek, VA under normal rush hour traffic is considered reasonable.

The requirement for maintaining these facilities shall not be construed to mean that the Government will be obligated to pay any direct costs in connection therewith. Further, the contractor shall not be entitled to any direct payment in connection with any personnel set in readiness at or brought into such facility in preparation or in exception of work to be performed under the contract. Payment for labor hours and materials will be made only for such hours and materials actually expended in performance under the contract.